New wording of the claims

1. Infrared measuring device, for essentially simultaneous, qualitative and quantitative determination of components in nonaqueous and aqueous systems, comprising at least one measuring unit, comprising at least one ATR body and at least one infrared light source, characterized by the fact that
the measuring unit contains at least one ATR body (2), which has at least two plane, essentially parallel boundary surfaces (5a, 5b), which is transparent or partially transparent to the measuring radiation and which has a refractive index which is higher than that of the medium to be investigated adjacent to at least one boundary surface, especially it is higher than or equal to 1.5, where the IR measuring radiation is middle infrared radiation (MIR) and can undergo attenuated total reflection at least six times on at least one of the plane, parallel boundary surfaces (5a) of the ATR body (2).

2. Infrared measuring device according to Claim 1, characterized by at least one, especially computer-aided evaluation units (7, 7') and/or at least one detector (6, 6').

3. Infrared measuring device according to Claim 2, characterized by the fact that the evaluation unit (7, 7') can be replaced by a second or further evaluation units (7, 7').

4. Infrared measuring device according to one of the previous Claims, characterized by the fact that
the infrared light source represents one or several quantum cascade lasers (4, 4') or a radiation source (4a) emitting a continuous or emitting a multiwavelength spectrum, where the radiation of this radiation source (4a) interacts with a sample system that can be included in or on the measuring unit and where the interferogram recorded by the detector (6) can be evaluated in the evaluation unit (7) using a Fourier transformation.

5. Infrared measuring device according to one of the previous Claims, characterized by the fact that
the plane, essentially parallel boundary surfaces (5a, 5b) are essentially not metal-coated.

6. Infrared measuring device according to one of the previous Claims, characterized by the fact that
the quantum cascade lasers(s) (4,4') can emit electromagnetic radiation of at least one defined frequency, especially with predetermined, defined intensity, or at least of a defined frequency band, especially with predetermined, defined intensity.

7. Infrared measuring device according to one of the previous Claims, characterized by the fact that
two or more quantum cascade lasers(s) (4,4') can emit electromagnetic radiation of different frequencies, especially each with predetermined, defined intensity, and/or of different frequency bands, especially in the middle infrared region, and/or especially each with predetermined, defined intensity.

8. Infrared measuring device according to Claim 7, characterized by the fact that
at least two quantum cascade lasers(s) (4,4') can emit electromagnetic radiation of different frequencies, especially each with predetermined, defined intensity, and/or of different frequency bands, especially in the middle infrared region, and/or especially each with predetermined, defined intensity, simultaneously or almost simultaneously.

9. Infrared measuring device according to one of the previous Claims, characterized by the fact that
one or several quantum cascade lasers(s) (4,4') can emit electromagnetic radiation of different frequencies, especially each with predetermined, defined intensity, and/or of different frequency bands, especially in the middle infrared region, and/or especially each with predetermined, defined intensity, in a time sequence.

10. Infrared measuring device according to one of the previous Claims, characterized by the fact that
a quantum cascade laser (4,4') can emit electromagnetic radiation in the form of pulses with defined duration, especially each with predetermined, defined intensity..

11. Infrared measuring device according to Claim 10, characterized by the fact that
the duration of the pulses, especially in the case of electromagnetic radiation with different frequencies or frequency bands, has a different length and/or the intensity of the pulses is of different magnitude.

12. Infrared measuring device according to Claim 10 or 11, characterized by the fact that different frequencies or frequency bands of electromagnetic radiation originating from one or several quantum cascade lasers (4, 4') can be emitted sequentially or in any arbitrary sequence.

13. Infrared measuring device according to Claim 12, characterized by the fact that the electromagnetic measuring radiation and/or its intensity can be detected according to a multiplex pattern, especially in a wavelength-specifically controllable, pulsewise emittable manner, and/or according to a multiplex pattern, especially corresponding to the multiplex pattern of the pulsed measuring radiation.

14. Infrared measuring device according to one of the previous Claims, characterized by the fact that
the measuring cell (1) is an especially pressure-resistant, flow-through cell or an especially pressure-resistant flow-through cell, which can be reversibly closed in the inlet and outlet region, or the measuring cell (1) or the ATR body (2) is an especially pressure-resistant immersion probe.

15. Infrared measuring device according to one of the previous Claims, characterized by the fact that
the ATR body (2) represents at least one wall of a measuring cell or a part thereof or represents the measuring cell (1).

16. Infrared measuring device according to one of the previous Claims, characterized by the fact that
the ATR body (2) is made of diamond, sapphire, cadmium telluride, thallium bromide/iodide, silicon, germanium, zinc selenide, zinc sulfide, magnesium difluoride, cesium iodide, silver chloride, calcium difluoride, potassium bromide, sodium chloride and/or a material transparent to infrared radiation, especially a polymeric material with a refractive index of preferably ≥ 1.5, especially polyethylene.

17. Infrared measuring device according to one of Claims 2 to 16, characterized by the fact that,
with the aid of the evaluation unit (7, 7'), factorial analyses, multiple least square algorithms or neuronal network analyses can be carried out based on the signals entering the detector (6, 6'), for the purpose of their evaluation.

18. Infrared measuring device according to one of the previous Claims, characterized by the fact that
at least the ATR body (2) and/or the measuring unit (1) can be or is thermostated.

19. Infrared measuring device according to one of the previous Claims, characterized by the fact that
the measuring unit (1) is pressure-resistant, especially to pressures up to 100 bar.

20. Infrared measuring device according to one of the previous Claims, characterized by the fact that
the ATR body (2, 12) can be placed at least on one boundary surface (5), which can be exposed to the medium to be analyzed, and includes a coating (14), which is transparent to the measuring radiation, especially to the evanescent field.

21. Infrared measuring device according to Claim 20, characterized by the fact that the coating (14) has a thickness which is smaller than, preferably half of the wavelength of the infrared measuring radiation used, and it is especially in the range from about 2 nm to about 25 μm, preferably from about 2 μm to about 10 μm.

22. Infrared measuring device according to Claim 20, characterized by the fact that the coating (14) has a thickness in the range of one-fourth of the wavelength of the measuring radiation used.

23. Infrared measuring device according to Claims 20 to 22, characterized by the fact that the coating (14) has an ATR body material layer, especially a diamond layer, and that the coated ATR body comprises preferably zinc selenide and/or zinc sulfide.

24. Infrared measuring device according to one of Claims 2 to 23, characterized by the fact that
the detector (6, 6') includes a photoacoustic detector.

25. Application of the infrared measuring device according to one of Claims 1 to 24, for the determination, especially essentially simultaneous, qualitative and/or quantitative determination of components, especially of saccharides, urea, creatinine, triglycerides, carbon dioxide, protein, alcohols and/or phosphoric acid esters, in nonaqueous and especially in aqueous systems.

26. Application according to Claim 25, where especially beer, wine, fruit juice, spirits or soft drinks are used as aqueous system.

27. Application according to Claim 25, where urine and/or feces is used as aqueous system.

28. Application according to Claim 25, where lymph, saliva and/or blood is used as aqueous system.

29. Application according to Claim 25, where the washing fluid obtained during dialysis is used as aqueous system.

30. Application according to Claim 25, where process fluid, waste water or washing liquor is used as the aqueous system.

31. Application of the infrared measuring device according to Claims 1 to 24 for the qualitative and/or quantitative determination of components in fruits and vegetables.

32. Application of the infrared measuring device according to Claims 1 to 24 for the qualitative and/or quantitative determination of components in milk and dairy products.

33. Urinal, or a urinal pan, containing
at least one ATR body, with at least two plane, especially essentially parallel boundary surfaces, which is transparent to middle infrared radiation (MIR), and has a refractive index which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, especially it is higher than or equal to 1.5, into which a laser beam, especially at least a beam of a quantum cascade laser can be coupled; and/or at least one discharge line, into which a measuring unit, especially a measuring cell, containing at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent or partially transparent to the measuring radiation, and has a refractive index, which is higher than that of the medium to be investigated adjacent to at least one boundary surface, especially higher than or equal to 1.5 is placed, into which a laser beam, especially at least one beam of a quantum cascade laser can be coupled.

34. Urinal according to Claim 34, especially including
an infrared measuring device according to one of Claims 1 to 24, characterized by the fact that the ATR body is in working connection with at least one quantum cascade laser and/or a detector and/or an evaluation unit.

35. Toilet, including a toilet bowl, containing
at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent to middle infrared radiation (MIR), and which has a refractive index, which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, especially higher than or equal to 1.5, into which a laser beam, especially at least one beam of a quantum cascade laser can be coupled; and/or at least a drainpipe, into which a measuring unit, especially a measuring cell, containing at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent or partially transparent to the measuring radiation and has a refractive index which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, especially higher than or equal to 1.5, is placed, into which a laser beam, especially at least one beam of a quantum cascade laser can be coupled.

36. Toilet according to Claim 35, especially comprising
an infrared measuring device according to one of Claims 1 to 24, characterized by the fact that the ATR body is in working connection with at least one quantum cascade laser and/or a detector and/or an evaluation unit.

37. Urinal, including a urinal pan, containing
at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent to middle infrared radiation (MIR), and which has a refractive index, which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, especially higher than or equal to 1.5, into which a light beam, having a continuous spectrum or a multiwavelength spectrum, especially in the middle infrared region, can be coupled; and/or at least a drain pipe, into which a measuring unit, especially measuring cell, containing at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent or partially transparent to the measuring radiation and has a refractive index which is higher than that of a medium to be investigated which is adjacent to at least one boundary surface, especially higher than or equal to 1.5, is placed, into which a light beam, having a continuous spectrum or a multiwavelength spectrum, especially in the middle infrared region, can be coupled.

38. Urinal according to Claim 37, especially including
an infrared measuring device according to one of Claims 1 to 24, characterized by the fact that the ATR body is in working connection with at least one light source, which emits a continuous spectrum or a multiwavelength spectrum, especially in the middle infrared region, and/or with a detector and/or with an evaluation unit.

39. Toilet, including a toilet bowl, containing
at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent to middle infrared radiation (MIR), and which has a refractive index, which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, especially higher than or equal to 1.5, into which a light beam, having a continuous spectrum or a multiwavelength spectrum, especially in the middle infrared region, can be coupled; and/or at least a drainpipe, into which a measuring unit, especially a measuring cell, containing at least one ATR body with at least two plane, especially essentially parallel boundary surfaces, which is transparent or partially transparent to the

measuring radiation and has a refractive index which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, especially higher than or equal to 1.5, is placed, into which a light beam, having a continuous spectrum or a multiwavelength spectrum, especially in the middle infrared region, can be coupled.

40. Toilet according to Claim 39, especially including an infrared measuring device according to one of Claims 1 to 24, characterized by the fact that the ATR body is in working connection with at least one light source, which emits a continuous spectrum or a multiwavelength spectrum, especially in the middle infrared region, and/or with a detector and/or with an evaluation unit.

41. Hollow body, especially a needle, a tube or an immersion probe, with nontransparent side walls, especially with a tapering end, characterized by the fact that, in one end region or at one end, especially at the tapered end, or on a surface of the hollow body, an ATR body is applied tightly, which has at least two plane, essentially parallel boundary surfaces, and which is transparent or partially transparent to middle infrared radiation (MIR), and has a refractive index which is higher than that of a medium to be investigated, which is adjacent to at least one boundary surface, especially higher than or equal to 1.5, where at least one laser beam can be coupled to the ATR body through the inside of the hollow body and at least one IR measuring beam can undergo attenuated total reflection at least six times along the measuring section, on at least one of the plane, parallel boundary surfaces of the ATR body.

42. Application of the hollow body according to Claim 41 as a measuring unit or as a component of a measuring unit of an infrared measuring device, especially in a measuring device according to Claims 1 to 24.

43. Application of the hollow body, especially of the tube or needle, according to Claim 42, for the invasive determination of components in body fluids, especially in the blood of living organisms.

44. Cannula, especially a stent, containing
at least one measuring cell, especially a flow-through cell, containing at least one ATR body with at least two plane, essentially parallel, boundary surfaces which is transparent or partially transparent to middle infrared radiation (MIR), and which has a refractive index which is higher than that of the medium being investigated, which is adjacent to at least one of the boundary surfaces, especially which is higher than or equal to 1.5, into which at least one beam of a quantum cascade laser can be coupled and at least one IR measuring beam can undergo attenuated total reflection at least six times along the measuring section, on at least one of the plane, parallel boundary surfaces of the ATR body; and/or at least one hollow body according to Claim 42.

45. Cannula according to Claim 44, especially comprising
an infrared measuring device according to one of Claims 1 to 25, characterized by the fact that the ATR body is in working connection with at least one quantum cascade laser and/or a detector and/or an evaluation unit.

46. Application of the cannula according to Claim 44 or 45 for the determination, especially essentially simultaneous, quantitative and/or qualitative determination, especially of two, three, four, five, six or more components, especially of saccharides, urea, creatinine and/or triglycerides, in multicomponent mixtures, especially in the body fluids of living organisms.

47. Measuring unit, especially measuring cell, comprising at least one ATR body, characterized by the fact that
the measuring unit contains at least one ATR body (2), which comprises at least two plane, essentially parallel boundary surfaces (5a, 5b), which is transparent or partially transparent to middle infrared radiation (MIR), and which has a refractive index which is higher than that of the medium to be investigated, which is adjacent to at least one boundary surface, especially higher than or equal to 1.5, where the measuring unit is pressure-resistant, especially to pressures up to 100 bar, and where at least one IR measuring beam can undergo attenuated total reflection at least six times along a measuring section on at least one of the plane, parallel boundary surfaces (5a) of the ATR body (2).

48. Automatic analyzer, comprising at least
an infrared measuring device according to one of Claims 1 to 24, a hollow body according to Claim 41 and/or a measuring unit according to Claim 47, at least one rinsing device for the measuring unit and/or the ATR body and/or at least one drying device for the measuring unit and/or the ATR body.

49. ATR body, comprising a first ATR body and a second ATR body, where the first and second ATR bodies are in contact at least so that a measuring beam can be coupled through the first ATR body into the second ATR body and that this measuring beam can be coupled out again from the second into the first ATR body, where the second ATR body has at least two plane, essentially parallel boundary surfaces of which the first boundary surface can be exposed to the medium to be analyzed and the second boundary surface faces the first ATR body and forms with it at least one closed, especially evacuated or gas-filled cavity.

50. Method, especially for essentially simultaneous, qualitative and/or quantitative determination of components in aqueous multicomponent systems, using an infrared measuring device according to one of Claims 1 to 24, a measuring device according to Claim 47, an automatic analyzer according to Claim 48 or an ATR body according to Claim 49, where the middle infrared beam(s) is(are) subjected to attenuated total reflection at least six times, especially seven times, on a measuring section at least of one plane boundary surface of the ATR body, which is immediately adjacent or is adjacent through a coating to the medium of the multicomponent system to be investigated.